

QUESTIONS REPORT

for Haz Mat Awareness and Operations 8.0.3

MSDS REFERENCE 035

Directions: Use this MSDS for the next five test items

Sample

MATERIAL SAFETY DATA SHEET

READ AND UNDERSTAND MATERIAL SAFETY DATA SHEET BEFORE HANDLING OR DISPOSING OF PRODUCT

PRODUCT CODE AND NAME	:	EO ETHYLENE OXIDE
ISSUE DATE	:	06/20/2001
MSDS CD DATE	:	7/1/2002

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATERIAL IDENTITY

PRODUCT CODE AND NAME

EO ETHYLENE OXIDE

Chemical Name and/or Family or Description:

Alkylene oxide

COMPANY INFORMATION

PTS Chemical
760 US Highway One, Suite 101
North Palm Beach, FL 33408

TELEPHONE NUMBERS

Transportation Emergency:

Company: (561) 863-2265

CHEMTREC: (800) 424-9300

Medical Emergency: (561) 555-1212

General MSDS Assistance: (561) 555-1213

Technical Information: (561) 555-1214

2. COMPOSITION AND INFORMATION ON INGREDIENTS

THE CRITERIA FOR LISTING COMPONENTS IN THE COMPOSITION SECTION ARE AS FOLLOWS: CARCINOGENS ARE LISTED WHEN PRESENT AT 0.1% OR GREATER; COMPONENTS WHICH ARE OTHERWISE HAZARDOUS ACCORDING TO OSHA ARE LISTED WHEN PRESENT AT 1.0% OR GREATER; NON-HAZARDOUS COMPONENTS ARE LISTED AT 3.0% OR GREATER. THIS IS NOT INTENDED TO BE COMPLETE COMPOSITIONAL DISCLOSURE. REFER TO SECTION 14 FOR APPLICABLE STATES' RIGHT TO KNOW AND OTHER REGULATORY INFORMATION.

Product and/or Component(s) Carcinogenic According to:
OSHA X IARC X NTP X OTHER X NONE

Composition:

Chemical Name	CAS Number	Exposure Limits	Range in %
Ethylene oxide	75-21-8	5 ppm STEL-PTS 100 5 ppm STEL-OSHA 1 ppm TWA-ACGIH-(A2) 1 ppm TWA-OSHA (SUBJECT TO 29 CFR 1910.1047)	

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THIS PRODUCT IS CONSIDERED HAZARDOUS ACCORDING TO OSHA (1910.1200)

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW

Appearance:

Colorless gas

Odor:

Ether-like odor

WARNING STATEMENT

DANGER!

FLAMMABLE GAS - MAY CAUSE FLASH FIRE
DELAYED EVAPORATION FROM CONTAMINATED
CLOTHING MAY BE A FIRE HAZARD
CORROSIVE - CAUSES EYE AND SKIN BURNS
HARMFUL OR FATAL IF SWALLOWED
LIQUID MAY CAUSE FROSTBITE
HARMFUL IF INHALED
MAY CAUSE DIZZINESS AND DROWSINESS
CAUSES RESPIRATORY TRACT IRRITATION AND CAN CAUSE
DAMAGE
MAY CAUSE ALLERGIC SKIN REACTION
MAY CAUSE BLOOD EFFECTS, LIVER, AND KIDNEY
DAMAGE BASED ON ANIMAL DATA
CONTAINS ETHYLENE OXIDE - CANCER HAZARD
AND REPRODUCTIVE HAZARD - CAN CAUSE NERVE
DAMAGE

HAZARD RATING SYSTEMS:

NFPA RATINGS

HEALTH =3
FLAMMABILITY =4
REACTIVITY =3
SPECIAL =None

HIMS RATINGS:

HEALTH =3*
FIRE =4
REACTIVITY =3
PERSONAL PROT. =None

POTENTIAL HEALTH EFFECTS

Primary Route of Exposure

Eye X Skin X Inhalation X Ingestion

Effects of Overexposure

Acute:

Eyes: Causes irritation, experienced as pain, with excess blinking and tear production, and seen as extreme redness and swelling of the eye and chemical burns of the eye. Severe eye damage may cause blindness. Eye contact with liquid product or gas under pressure can cause frostbite (cold burns).

Skin: Causes severe irritation with pain, severe excess redness and swelling with chemical burns, blister formation, and possible tissue destruction. Skin contact with liquid product can cause frostbite (cold burns). Other than the potential skin irritation effects noted above, acute (short term) adverse effects are not expected from brief skin contact; see other effects, below, and Section 11 for information regarding potential long term effects.

Inhalation: Gas is irritating and causes nasal discharge, coughing, and discomfort in nose and throat.

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dizziness, drowsiness, euphoria, loss of coordination, disorientation, headache, nausea, and vomiting. In poorly ventilated areas or confined spaces, unconsciousness and asphyxiation may result. Inhalation may result in the absorption of potentially harmful amounts of material.

Ingestion: Causes burning of mouth, throat, and stomach with abdominal and chest pain, nausea, vomiting, diarrhea, thirst, weakness, and collapse. Aspiration may occur during swallowing or vomiting, resulting in lung damage.

Sensitization Properties: This product or a component of this product is a known human skin sensitizer. Therefore, contact with this product may cause an allergic skin reaction in sensitive, exposed persons.

Chronic:

According to IARC and OSHA, ethylene oxide is a human carcinogen. Prolonged and repeated overexposure has reportedly produced symptoms of neurotoxicity experienced as weakness in the hands and feet, accompanied by a tingling sensation in some cases. In most cases, these symptoms resolved after exposure was terminated. Repeated skin contact may cause a persistent irritation or dermatitis. Repeated inhalation may cause lung damage.

Medical Conditions Aggravated by Exposure:

Overexposure may aggravate existing blood disorders, such as anemia. Skin contact may aggravate an existing dermatitis (skin condition). Overexposure to vapor, dust or mist may aggravate existing respiratory conditions, such as asthma, bronchitis, and inflammatory or fibrotic respiratory disease. Repeated overexposure may aggravate or enhance existing nervous system dysfunction.

Other Remarks:

OSHA has defined ethylene oxide as a reproductive and cancer hazard. IARC has classified ethylene oxide as a Group I carcinogen ("carcinogenic to humans"). Ethylene oxide is a mutagen. Increased incidences of chromosomal aberrations and sister chromatid exchanges have been observed in workers exposed to ethylene oxide. The relevance of these findings in evaluating human health effects is currently unknown.

4. FIRST AID MEASURES

Ignition Temperature - AID (degrees C):
571.1 (1060F)

Flash Point (degrees C):
-57 (-70.6F) CC

Flammable Limits % (Lower-Upper):
Lower: 3
Upper: 100

Recommended Fire Extinguishing Agents And Special Procedures:

Dilution with 30 or more volumes of water renders liquid nonflammable. Fight fire from protected location or maximum possible distance. Use dry chemical, alcohol resistant foam, carbon dioxide, or water spray. Use water spray to cool fire-exposed containers.

Unusual or Explosive Hazards:

Danger! Extremely flammable materials may release vapors that travel long distances, ignite, and flash back. Containers may explode in a fire. Do not expose to heat, sparks, flame, static, or other sources of ignition. When handling, use non-sparking tool, ground and bond all containers. Explosive air-vapor mixtures may form.

Special Protective Equipment for Firefighters:

Wear special chemical protective clothing and positive pressure self-contained breathing apparatus. Approach fire from upwind to avoid hazardous vapors and toxic decomposition products. Decontaminate or discard any clothing that may contain chemical residues.

6. ACCIDENTAL RELEASE MEASURES (Transportation Spills: CHEMTREC (800)424-9300)

Procedures In Case of Accidental Release, Breakage or Leakage:

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downwind explosion hazard. Avoid all personal contact. Avoid breathing vapor. Pressure demand air supplied respirators should always be worn when the airborne concentration of the contaminant or oxygen is unknown. Otherwise, wear respiratory protection and other personal protective equipment as appropriate for the potential exposure hazard. Avoid contact with eyes, skin, or clothing.

7. HANDLING AND STORAGE

Precautions to be Taken in

Handling:

Use spark-proof tools. Material may be at elevated temperatures and/or pressures. Exercise care when opening bleeders and sampling ports. Eye wash and safety shower should be available nearby when this product is handled or used. Solid or semi-solid self-polymerized ethylene oxide residue in empty containers can release significant amounts of ethylene oxide vapor. Therefore, appropriate precautions should be taken when cleaning residual polymerized ethylene oxide from tanks and storage vessels.

Storage:

Ground and bond shipping container, transfer line, and receiving container. Keep away from heat, sparks, flame, and other sources of ignition.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Protective Equipment (Type)

Eye/Face Protection:

Avoid eye contact. Chemical type goggles with face shield must be worn. Do not wear contact lenses.

Skin Protection:

Protective clothing, such as coveralls or lab coats, and gloves must be worn. Launder or dry clean when soiled. When handling large quantities, chemical resistant suits, gloves, and boots must be worn. Selected protection should resist hazards such as tears, cuts, punctures, and abrasion. Leather shoes must be immediately removed if contaminated. Based on study by an independent lab, sponsored by CMA, Chemtrec Max garment and 4H glove have, according to CMA, proven effective against gas/liquid exposure.

Respiratory Protection:

Airborne concentrations should be kept to lowest levels possible. If vapor mist or dust is generated and the occupational exposure limit of the product, or any components of the product, is exceeded, use appropriate NIOSH or MSHA approved air purifying or air supplied respirator after determining the airborne concentration of the contaminant. Air supplied respirators should always be worn when airborne concentration of the contaminant or oxygen content is unknown.

Ventilation:

Use explosion-proof equipment to maintain adequate ventilation to meet occupational exposure limits, if applicable (see below), prevent accumulation of explosive air-gas mixtures, and avoid significant oxygen displacement. Oxygen levels should be at least 19.5% in confined spaces or other work areas (OSHA value).

Exposure Limit for the Total Product:

Ethylene oxide: OSHA PEL-TWA 1ppm; PEL-STEL 5 ppm; ACGIH TLV-TWA 1 ppm.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:

Colorless gas

Odor:

Ether-like odor

Boiling Point (degrees C):

10.7 (51.3F)

Melting/Freezing Point (degrees C):

Not applicable.

Specific Gravity (water=1):

.8711

pH:

Not applicable.

Vapor Pressure:

1095 mmHg at 20 C (68F)

Viscosity:

.3 cSt at 0 C (32F)

VOC Content:

Not Determined

Vapor Density (Air=1):

1.4

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None

10. STABILITY AND REACTIVITY

This Material Reacts Violently With:

Air Water Heat X Strong Oxidizers X Others X None of these

Comments:

This material reacts with strong oxidizers, acids, bases, and acetylide-forming metals such as copper, silver, mercury, and their alloys.

Products Evolved When Subjected to Heat or Combustion:

Toxic levels of carbon monoxide, carbon dioxide, irritating aldehydes and ketones.

Hazardous Polymerizations:

OCCUR

11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION (ANIMAL TOXICITY DATA)

Oral:

LD50 .33g/kg (rat) toxic

Inhalation:

4 hr. LC50 800.00 ppm (gas, vapor) (rat) toxic

Dermal:

LD50 Believed to be > 1.00 - 2.00 g/kg (rabbit) slightly toxic

IRRITATION INDEX, ESTIMATION OF IRRITATION (SPECIES)

Skin:

(Draize) Believed to be 6.50 - 8.00/8.0 (rabbit) corrosive

Eyes:

(Draize) Believed to be > 80.00 - 110.00/110 (rabbit) extremely irritating

Sensitization:

Not determined.

Other:

Ethylene oxide causes tumors in laboratory animals. Study in male mice have demonstrated that exposure to high concentrations cause injury to the testes. Although embryo/fetal toxicity occurs in laboratory animals exposed to high concentrations, there is no evidence that ethylene oxide causes birth defects.

12. DISPOSAL CONSIDERATIONS:

Waste Disposal Methods:

This product (as presently constituted) has the RCRA characteristics of ignitability and reactivity, and, if discarded in its present form, would have the hazardous waste number of D001 and D003. Under RCRA, it is the responsibility of the user of the product to determine, at the time of disposal, whether the product meets RCRA criteria for hazardous waste. This is because product uses, transformations, mixtures, processes, etc. may change the classification to non-hazardous, or hazardous for reasons other than, or in addition to, ignitability and reactivity.

Remarks:

Do not allow to enter drains or sewers. Can cause explosion.

13. TRANSPORT INFORMATION

Transportation

DOT:

Proper Shipping Name:
Ethylene oxide

Hazard Class:
2.3/2.1

Identification Number:
UN 1040

Packing Group:

Label Required:
Poison gas, Flammable gas

Depending on container size, spills of this product may require reporting under SARA 304 and/or CERCLA 102(A) regulations.

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IMDG:

Proper Shipping Name:
Not evaluated

ICAO

Proper Shipping Name:
Not evaluated

TDG

Proper Shipping Name:
Ethylene oxide

Hazard Class:

2.1/6.1

Identification Number:

UN1040

Label Required:

Flammable gas, Poison

14. REGULATORY INFORMATION

Federal Regulations:

SARA Title III:

Section 302/304 Extremely Hazardous Substances

Chemical Name	CAS Number	Range in %	TPQ	RQ
Ethylene Oxide	75-21-8	100	1000	10

Section 311 Hazardous Categorization:

Acute X Chronic X Fire X Pressure X Reactive X NA

Section 313 Toxic Chemical

Chemical Name	CAS Number	Concentration
Ethylene oxide	75-21-8	100

CERCLA 102(a)DOT Hazardous Substances:

Chemical Name	CAS Number	Range in %	RQ
Ethylene oxide	75-21-8	100	10

States Right-to-Know Regulations:

Chemical Name:	State Right-to-Know
Ethylene oxide	CT, FL, IL, LA, MA, NJ, PA, RI, MI

State list: CT (Connecticut), FL (Florida), IL (Illinois), MI (Michigan), LA (Louisiana), MA (Massachusetts), NJ (New Jersey), PA (Pennsylvania), RI (Rhode Island)

California Prop. 65:

The following detectable components of this product are substances, or belong to classes of substances, known to the State of California to cause cancer and/or reproductive toxicity.

Chemical Name	CAS Number
Ethylene oxide	75-21-8

INTERNATIONAL REGULATIONS:

TSCA Inventory Status:

This product, or its components, are listed on or are exempt from the Toxic Substances Control Act (TSCA) Chemical Substance Inventory.

WHMIS Classification:

Class D, Div 1, Subdiv A: Very toxic Class D, Div 2, Subdiv A: Carcinogenic Class B, Div 1: Flammable gas

Canadian Inventory Status:

This product, or its components, are listed on or are exempt from the Canadian Domestic Substance List (DSL).

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This product, or its components, are listed on or are exempt from the European Inventory of Existing Chemical Substances (EINECS) or the European List of Notified Chemical Substances (ELINCS).

Australian Inventory Status:

This product, or its components, are listed on or are exempt from the Australian Inventory of Chemical Substances (AICS).

Japan Inventory Status:

This product, or its components, are listed on or are exempt from the Japan Ministry of International Trade and Industry (MITI) inventory.

15. ENVIRONMENTAL INFORMATION

Aquatic Toxicity:

LC50-96hr Aquatic toxicity rating is > 10.00 - 100.00 ppm slightly toxic

Mobility:

Not determined.

Persistence and Biodegradability:

Not determined.

Potential to Bioaccumulate:

Not determined.

Remarks:

None

16. OTHER INFORMATION 06/20/2001

CAUTION! DO NOT ALLOW UNTRAINED WORKERS TO HANDLE THIS MATERIAL!

PTS recommends that all exposures to this product be minimized by strictly adhering to recommended occupational controls procedures to avoid any potential adverse health effects.

THE INFORMATION IN THIS DATA SHEET IS PROVIDED INDEPENDENTLY OF ANY SALE OF THE PRODUCT. IT IS PROVIDED FOR THE PURPOSE OF HAZARD COMMUNICATION AS PART OF PTS' PRODUCT SAFETY PROGRAM. IT IS INTENDED ONLY AS A GUIDE TO THE APPROPRIATE PRECAUTIONARY HANDLING OF THE PRODUCT BY A PROPERLY TRAINED PERSON. YOU ARE ENCOURAGED AND REQUESTED TO ADVISE THOSE WHO MAY COME IN CONTACT WITH SUCH PRODUCTS OF THE INFORMATION CONTAINED HEREIN. THE DATA RELATES ONLY TO THE SPECIFIC PRODUCT DESIGNATED, AND DOES NOT RELATE TO USE OF THE PRODUCT IN COMBINATION WITH ANY OTHER MATERIAL OR USE OF THE PRODUCT IN ANY PROCESS. THE DATA IS NOT INTENDED TO CONSTITUTE PERFORMANCE INFORMATION CONCERNING THE PRODUCT.

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REFERENCE LIST 001

REFERENCE LIST HAZ-MAT AWARENESS AND OPERATIONS - V 8.0.3

<u>Publisher/Title/Edition</u>	<u>Reference Code</u>
1. IFSTA, Hazardous Materials for First Responders, 3rd Edition	HMFR 3
2. IFSTA, Essentials of Fire Fighting and Fire Department Operations, 5th Edition	EFFDO 5
3. Delmar, Hazardous Materials Incidents, 2nd Edition	HMI 2
4. Delmar, Firefighter's Handbook, 3rd Edition	FHB 3
5. Jones and Bartlett, Fundamentals of Fire Fighter Skills, 2nd Edition	FFFS 2
6. NFPA 472, Standards for Professional Competence of Responders to Hazardous Materials Incidents, 2008 Edition	NFPA 472
7. DOT, Emergency Response Guidebook, 2004 Edition	ERG 04